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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,532	10/03/2003	Hwa-jun Kim	1793.1022	9331
21171	7590	12/14/2004	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			MERCEDES, DISMERY E	
			ART UNIT	PAPER NUMBER
			2651	

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/677,532

**Applicant(s)**

KIM ET AL.

**Examiner**

Dismery E Mercedes

**Art Unit**

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2003.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-14 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 03 October 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the step “determining whether the read data is normal” in page 5, paragraph 0032, as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the step of “determining whether the

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read data is normal” of claim 1, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claim 8 is rejected under 35 U.S.C. 102(a) as being anticipated by Applicant’s Admitted Prior Art, hereinafter, AAPA (pages 1-3 and FIG.1 of instant specification).

AAPA discloses an off-track retry method for recovering data comprising: measuring an off-track amount at a location where a read error occurs; reading data based upon the measured off-track amount; determining whether the read data is normal; and determining whether the data incorrectly read due to the read error has been recovered (FIG.1).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US 6,650,491 B2), in view of Applicant's Admitted Prior Art, hereinafter AAPA.(of instant application, pages 1-3 of the specification and FIG.1).

Suzuki et al. discloses an off-track retry method for recovering data incorrectly read due to a read error caused by an off-track error in a disk drive, the off-track retry method comprising: extracting read gain characteristics while varying an off-track amount (as depicted in Figures 11a-11b); determining an off-track amount based upon the read gain characteristics (as depicted in Figures 11a-11b & FIG.6, "S5-S7").

Suzuki et al. does not specifically disclose reading data using the determined off-track amount; determining whether the read data is normal; and determining whether the data incorrectly read due to the read error has been recovered.

However, AAPA discloses such on FIG.1 (of instant application).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to implement AAPA 's steps to the method disclosed by Suzuki, the motivation being because it would provide the Suzuki's method with the enhanced capability of determining if the process was successful by verifying if the data has being successfully read.

As to Claim 2, in the obvious combination, AAPA further discloses a method wherein reading the data by moving a head away from a centerline of a track by up to a determined off-track amount; and reading the data by moving the head away from the centerline of the track by up to an off-track range having a predetermined difference with the determined off-track amount (as depicted in FIG. 1, "S106" & page 2, ¶0010 and ¶0012 of instant application).

As to Claim 3, Suzuki et al. further discloses measuring read gains while gradually varying an off-track amount within a predetermined off-track range (col.4, lines 51-52 & as depicted in Figures 8a-b, 11a-b); determining an off-track direction based upon a gradient of a curve of the measured read gains (col.4, lines 33-38 & col.4, lines 1-8); and identifying an off-track amount corresponding to a minimum of the measured read gains (col.3, lines 57-64; col.4, lines 1-8 & 40-47 and as depicted in Figures 11a and 11b)

As to Claim 4, Suzuki et al. further discloses measuring read gains at a place on the centerline of a track and a plurality of places at either side of the centerline of the track and determining an off-track direction based upon a gradient of a curve of the measured read gains (col.4, lines 33-38 and as depicted in Figures 8a-b and 11a-b); measuring read gains while gradually varying an off-track amount within a predetermined off-track range (col.4, lines 51-52 & as depicted in Figures 8a-b, 11a-b); and identifying an off-track amount corresponding to a

minimum of the measured read gains (col.3, lines 57-64; & 40-47 and as depicted in Figures 11a and 11b).

As to Claim 5, Suzuki et al. further discloses determining an off-track direction and a degree to which data is recorded off-track (col.4, lines 33-38).

As to Claim 6, Suzuki et al. further discloses the off-track retry method of claim 1, wherein the read gain is smallest when data is magnetized in a negative direction off of a centerline of a desired track and the off-track amount reaches a predetermined off-track amount in the negative direction; and the read gain increases as the off-track amount increases (as depicted in Figures 11a-11b).

As to Claim 7, Suzuki et al. further discloses the read gain is smallest when data is magnetized in a positive direction off of a centerline of a desired track and the off-track amount reaches a predetermined off-track amount in the positive direction; and the read gain decreases as the off-track amount increases (as depicted in FIG.11a).

7. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Suzuki et al. (US 6,650,491 B2).

AAPA disclosed all the limitations of the off-track retry method of base claim 8, as noted in the 102 rejection above. AAPA fails to specifically disclose extracting read gain characteristics while varying the off-track amount; and determining an off-track direction and a degree based upon the read gain characteristics.

However, Suzuki et al. discloses such (on Figures 11a-11b & Figures 10a-b).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention, to implement Suzuki's technique to the method disclosed by AAPA, the motivation

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being because it would provide AAPA's method with the enhanced capability of improving measurement precision and obtaining an RW offset value from the mean calculation based on the amplitude characteristics (col.3, lines 61-65 of Suzuki et al.).

As to Claim 10, in the obvious combination, Suzuki et al. further discloses the off-track direction is identified based upon a gradient of a read gain curve showing the read gain characteristics (col.4, lines 33-38 & col.4, lines 1-8).

8. Claims 11-12 are rejected as being unpatentable over Suzuki et al. in view of Applicant's Admitted Prior Art, hereinafter, AAPA (pages 1-3 and FIG.1 of instant specification).

Suzuki et al. discloses an off-track retry method determining an off-track direction and an off-track amount at the same time by measuring read gains at different places while gradually varying the off-track amount within a predetermined off-track range (as depicted in Figures 8a-b, 11a-b).

Suzuki et al. does not specifically disclose reading data using the determined off-track direction and the off-track amount; determining whether the read data is normal; and determining whether the data incorrectly read due to the read error has been recovered

However, AAPA discloses such (on FIG.1 of instant specification).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to implement AAPA's steps to the method disclosed by Suzuki, the motivation being because it would provide the Suzuki's method with the enhanced capability of determining if the process was successful by verifying if the data has being successfully read.



As to Claim 12, Suzuki et al. further discloses off-track direction is identified based upon a gradient of a curve of the measured read gains (col.4, lines 33-38 and as depicted in Figures 8a-b and 11a-b).

9. Claim 13 is rejected as being unpatentable over Suzuki et al. in view of Applicant's Admitted Prior Art, hereinafter, AAPA (pages 1-3 and FIG.1 of instant specification).

Suzuki et al. discloses an off-track retry method obtaining an off-track amount by measuring a read gain at three points (as depicted in Figures 8a-b, 11a-b).

Suzuki et al. does not specifically disclose reading data using the off-track amount; determining whether the read data is normal; and determining whether the data incorrectly read due to the read error has been recovered.

However, AAPA discloses such (on FIG.1 of instant specification).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to implement AAPA's steps to the method disclosed by Suzuki, the motivation being because it would provide the Suzuki's method with the enhanced capability of determining if the process was successful by verifying if the data has been successfully read.

As to Claim 14, Suzuki et al. further discloses measuring the read gain at a centerline of a track (as depicted in Figures 11a-11b); measuring the read gains at a first point and a second point on either side of the centerline of the track (as depicted in Figures 11a-11b); determining an off-track direction based upon a gradient of a curve of the measured read gains (col.4, lines 33-38 and as depicted in Figures 8a-b and 11a-b); remeasuring the read gains while varying the off-track amount in a predetermined off-track range (as depicted in Figures 11a-11b); differentiating

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the measured read gains; and determining the off-track amount based upon a maximum value of the result of the differentiation (col.4, lines 1-8).

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Smith et al. (US 6,078,461) discloses an insitu offset correction for position error signal
- Wakefield (US 6,178,054 B1) discloses selecting write fault thresholds by head and disc location in a disc drive.
- Fung et al. (US 5,353,170) discloses error recovery data storage system and method with two position read verification.
- Le et al. (US 6,008,962) discloses a method and apparatus for providing read and write skew offset information for magneto resistive head
- Tswako et al. (US 5,696,643) discloses a disk drive apparatus and read error recovery method in a disk drive apparatus
- Mukohara (5,936,789) discloses an off-track tester for testing MR head and method of testing the same
- Suzuki et al. (US 5,521,773) discloses a method of compensating off-track in disk unit


11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dismery E Mercedes whose telephone number is 703-306-4082. The examiner can normally be reached on Monday - Friday, from 9:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 703-305-4040. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DM



W. R. YOUNG  
PRIMARY EXAMINER